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ABSTRACT

A study investigated the degree to which first language ability was associated with successful English-as-a-second-language acquisition in 33 outstanding Indonesian teachers. It examined the applicability of theories of common underlying proficiency in the storage of two languages and the development of cognitive academic language proficiency. The teachers had been selected to participate in a master's program in teacher education sponsored by the World Bank. Before beginning the program, the teachers attended three months of training in English for special purposes (ESP) and took sheltered courses in pedagogy for six weeks. After the initial ESP course, the participants underwent a series of tests including English language tests and a test of inferential ability. After the sheltered courses, the teachers' grades were analyzed. Results suggest that while strong first language inferencing ability is associated with better second language ability, English language proficiency is a more salient variable in determining foreign students' grade performance. Several interpretations of the results, relating to both the theoretical models and the tests used, are suggested. Additional cultural orientation for foreign students is recommended. (MSE)

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The Effects of Native Language Inferencing Ability in English for Specific Purposes

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The Effects of Native Language Inferencing Ability in English for Specific Purposes

Introduction

One of the gravest problems facing foreign university students in the U.S. is their English language proficiency. If universities require that foreign students take English as a second language (ESL) courses, students are not enrolled in credit-generating courses. Usually they cannot apply ESL courses toward a degree, particularly a graduate degree. Students, frequently on tight budgets, cannot afford to attend many semesters of non-degree oriented work. Additionally, many of the ESL courses are not related to the major field of study.

One movement that attempts to address these issues is the English for Specific Purposes (ESP) movement. In ESP programs the major field of interest is targeted. Students learn English for engineers, chemists, and the like, instead of spending time learning how to order in a restaurant or fill out a job application, as many generic ESL texts require.

Most proponents of the ESP movement stress the importance of domain-specific vocabulary and grammar (eg., Widdowson & Brumfit, 1981). However, the recent emphasis on prior knowledge in second language learning in elementary schools, and particularly in bilingual education programs, may provide insights into how adults acquire a second language as well. This is a study of one ESP program that attempted to build on prior knowledge.

Theoretical Framework

For years popular belief held that children had an advantage in second language acquisition. Ervin-Tripp (1974) challenged that premise with the news that adults were simply smarter: they have more memory heuristics, more prior experience to draw from, and consequently faster second language acquisition.

Cummins (1980) explained how these cognitive advantages contributed to second language learning. First, Cummins proposed a new underlying assumption about the storage of two languages in memory. Rather than the two languages being stored as separate, Cummins posited one storage system with access to the concepts via the two languages. This perspective is in line with current views of the development of schemes, especially those based on cognitive psychology and Piagetian learning theories.

Next, Cummins found that studies of immigrant children in several settings corroborated the "older is smarter" principle. Older students with greater metalinguistic awareness were able to perform cognitively demanding tasks in the second language faster than younger learners.

These findings led Cummins (1981) to propose that there is an overlap in the storage of the two languages that he called the Common Underlying Proficiency (CUP). Some concepts are not language specific. When new vocabulary is learned to express the understanding of these concepts in the new language, the learner has access to the concepts in either language.

This theoretical framework is well accepted in bilingual education. However, educators of adult second language students

must question the extent to which prior knowledge in the first language contributes to second language acquisition. If this is a linear relationship, the greater the conceptual development in one field of study, the greater the second language development should be in that same field. With the growth of English for Specific Purposes (ESP), this perspective has great theoretical and practical consequences.

One of the concerns about Cummins' work lies in the definition of CALP (eg., Baral, 1987). How can scholars measure cognitive ability? Cummins (1981) proposed that it was measured in schools by standardized achievement tests. Similarly, Chamot and O'Malley (1986) have operationally defined CALP as academic subject learning in schools. Guerra (1983), studying undergraduate university students, proposed that CALP be measured in aspects of metalinguistic awareness. Her adult subjects were tested on their ability to recognize English errors.

Research on prior knowledge in reading may provide insights on the measurement of CALP, because reading appears to involve a complex unification of cognitive and linguistic skills (Barnitz & Speaker, 1987). Goodman and Goodman (1978) found that reading strategies, like Cummins' CUP model, are generally uniform across languages and allow reading proficiency to transfer across languages. Flores (1982) asserted that even differences in orthographies, morphology, syntax, lexicon or text structure will not interfere with reading comprehension because of the transferability of many of the universal reading processes.

Flores' assertion has been corroborated by several cross

cultural studies. Johnson (1981) found that the cultural aspects of text were more critical in text comprehension than the semantic and syntactic complexity of the text. Nelson (1987) found similar results among college graduate Egyptian ESL students. Reviews by Barnitz (1986) and Carrell (1983) describe the role of prior knowledge in second language reading.

The Goodmans (1978) identified some of the universal reading processes as predicting and inferencing. Barnitz and Speaker (1987) found that inferencing was a salient process that varied by age and education. However, inferencing appeared to take place even in spite of limited second language proficiency.

Inferencing may be a particularly important process in ESP programs because it is a skill that is also needed in content area learning. Sampson (1977) included inferencing in her selection of Tough's (1970) linguistic functions appropriate for ESP programs in elementary schools.

This paper attempts to test Cummins' (1981) CUP model; that is, will Cognitive Academic Language Proficiency (CALP) in the native language enhance CALP development in the second language? Specifically, the English and content area progress of 33 students in an English for Specific Purposes (ESP) and Master's of Education program were measured. The effect of their ability to make inferences in their native language on their academic grades was then studied.

Method

Subjects

To study the degree to which first language ability was associated with successful English as a second language acquisi-

tion, a group of 33 Indonesian scholars was studied. It was reasoned that this group could provide insights into the role of prior knowledge in second language acquisition for several reasons. First, intelligence and motivation were partially controlled in the selection process. The scholars were selected as among the most promising educators in their country to take part in a master's degree program in teacher education in the United States, sponsored by the World Bank. Second, educated Indonesians are at least bilingual. The scholars should have successful second language learning schemata. Most importantly, they were studying the new language in education, and they were educated as teachers and had several years teaching experience. Transfer of first language concepts to the target language should facilitate their learning of English and their content area learning as well.

Before beginning work on their Master's degrees, the scholars participated in three months of ESP training. They then took sheltered courses in general pedagogy for six weeks.Then they entered regular Master's degree courses in their fields of physical education, mathematics, science, and social studies education.

Instruments

After three months of ESP study, the scholars were given a battery of English tests. The reading test was selected from the Maculaitis Assessment Program (MAC) (Maculaitis, 1983) and consisted of paragraphs with multiple choice questions over the content of the paragraphs. They were given eight minutes to read

two general content paragraphs of approximately 100 words each. There were eight questions over the readings.

The writing test, also from the MAC, consisted of a series of four pictures of the sequence of a cookout. The subjects were given the vocabulary for hot dog, to assure that they had the basic word needed for the task. They were given six minutes to write at least six sentences telling about the pictures.

The listening test from the MAC consisted of eight minutes of examiner-read questions with multiple choice answers. In the first series the examiner read questions, and the subjects were supposed to select the appropriate rejoinder. In the second series they heard a statement and were asked to select the next appropriate statement in the conversation.

The scholars were also given some instructor-designed tests. The grammar test consisted, first, of a fill-in test in which the subjects had to select the gerund or the infinitive form of the verb in parentheses. Part II of the grammar test asked the subjects to change the sentence from the active to the passive. In Part III the subjects had to conjugate the verb in parentheses, given the context of a paragraph. Part IV required that the subjects ask an appropriate question given two dialog settings. In Part V the subjects were given information about two young women and were to compare them in five sentences. Part VI consisted of more verbs to conjugate in context with modals included. The test had a total of 81 points.

The cloze test consisted of a paragraph from one of their textbooks on educational psychology with every seventh word omitted. Any appropriate answer was counted as correct. The

maximum possible score was 15.

The instructors also designed another listening test, similar to the other test in format but with questions about the participants' experiences in the United States. This score was added to the MAC listening score for a total listening score of 18.

At the same time the scholars were given the Inference Test (Ekstrom et al., 1976), which had been translated to Bahasa Indonesia by a certified translator. It was reasoned that a standardized measure of one aspect of CALP--inferencing ability--was a better indicator of CALP than a specific content-area test. On the Inference Test each of the 20 items presents a brief statement description followed by five conclusions that people might draw from the statement without assuming anything in addition to the information provided in the statement. There is only one correct conclusion. Reliability of the Inference Test has been reported to be .57 (Ekstrom et al., 1976).

During the next six weeks, the participants took part in sheltered education courses. Two professors from the regular graduate education program provided six hours of introductory courses in educational psychology and curriculum theory. In this coursework the scholars were given instructor-designed tests. The grades in these courses were averaged for a measure of the scholars' content-area progress in the sheltered courses.

At the end of the fall semester 1987, the students' cumulative grade point average (gpa) was calculated. At that time the scholars had finished between 21 to 29 hours toward their Mas-

ter's degrees. Approximately three-fourths of that work was done in classes designed especially for this population. The other coursework was taken in the field of study, namely mathematics, science, or physical education.

Analysis

A Pearson product moment correlation was conducted to determine the relations between the language measures, the native language problem solving measure, and the course grades. Moderate to high correlations were found between the Inference Test and all the language measures except the reading score. This lack of significance was probably due to the small variance in the reading score, so it was excluded from further analyses.

A setwise regression analysis was then conducted to determine the effects of the language measures and inference test score on the grades in the sheltered education classes. Specifically, the Inference Test, grammar, writing, and cloze tests were regressed on the average grades for the initial term.

An analysis of the correlation between the language assessment instruments and the grade point average at the end of the Fall 1987 semester was then conducted. The language measures were standardized and converted to T scores; the average T score then became the English proficiency measure. A setwise multiple regression analysis was then conducted to determine the effects of the language measures and the IF on the cumulative gpa.

Results

The results of the Inference Test showed that very few of the scholars were able to perform successfully in their national language. Out of a possible 20 points, the average score was

4.85. This score, however, was significantly correlated with their English language acquisition as measured by all the language measures except reading.

The first regression analysis was significant at $p < .001$, with the model explaining 47% of the variance. The only statistically significant variable in the equation was the writing score.

In the second analysis, the model explained 31% of the variance. The English proficiency measures were significant at the $p = .02$ level. The relative importance of the English score compared to the Inference test is notable. As can be seen in Table 3, the beta score for the English measures is .48 compared to .11 for the Inference Test. In short, the English score is over four times more important than the Inference Test in the equation.

Discussion

The findings of this study suggest that strong first language inferencing ability are associated with better second language ability, but that English language proficiency is a more salient variable in determining foreign students' graduate performance. Comparing the betas in the second regression equation, one is struck by the comparative weight of each variable.

The independent variables were, however, better predictors of success in the sheltered program than in the overall Master's program. This may be due to the nature of their areas of emphasis. Grades in the courses outside of education indicate that the math students in particular were apparently able to draw

on prior knowledge, while the science specialists had a difficult time performing in those classes.

The results, however, may be interpreted in various ways. Using Cummins' (1981) theoretical framework, the findings suggest that prior conceptual ability is associated with the acquisition of English as a second language. Perhaps the rate of acquisition of English was influenced initially by prior cognitive abilities. To study this, a causal model could be designed in which a measure of cognitive abilities could serve as the exogenous variable with English language measures and grade point average being the endogenous variables. In this way the direct and indirect effects of inferencing ability on grade point average could be measured. Such a study is suggested not only from a theoretical perspective but also from the tolerance levels calculated in the second regression equation. The tolerance level of 57.8% suggests considerable overlap in the two variables. A causal model based on Cummins' theoretical model would be an appropriate method for investigating the total effects of the two variables.

It is possible, however, that the Inference Test was not an appropriate measure of these students' inferencing ability. It may have measured more of an orientation to test taking than it did native language ability. As Hamilton (1983) has pointed out, taking a test is in itself a problem solving situation. Multiple choice tests may be biased toward those scholars with a more Western cultural orientation. As Acton (1979) has shown, students who perceive less social distance between themselves and the target culture may learn the second language faster. Is less

social distance related to metalinguistic awareness, since awareness is defined culturally? If so, CALP may need to be explained in cultural terms, as Cummins (1986) appears to do in a recent article.

The issues for second language educators and researchers are complex. On one hand, ESP programs provide great hope for building new language skills on prior knowledge. If Cummins' CUP exists, ESP programs should draw on it in the development of the English curriculum.

On the other hand, prior knowledge always presumes a cultural orientation, even in scientific fields. Testing that knowledge is particularly culture bound. In this study, for instance, the participants should probably be retested on the Inference Test. If they score significantly higher, then it would be possible to conjecture that the structure of the test interfered with the measurement of actual inferencing ability.

The Inference Test, which asks the subject to make an inference on the basis of a short paragraph, is intended to be a measure of higher order thinking. It may be, however, that the scholars are not accustomed to deriving inferences from materials. In many societies, schooling concentrates on the cognitive levels of knowledge and understanding. Since the scholars were selected as outstanding in their fields, it must be assumed that they are considered superior scholars in their own culture. I suspect that the Inference Test measures the higher order cognitive skills of analysis and synthesis required of U.S. graduate students but seldom emphasized abroad.

Such an interpretation is suggested by Barnitz and Speaker

(1987). They found that the university students in their study made far fewer inferences in English than did the seventh graders, even when the older learnrs had superior English language ability. They conjectured that the older students may have been trained over the years to focus on literal surface level language while the younger learners still explored meaning and took risks.

It appears that, in addition to increasing their English skills, foreign students need to be acculturated into the American graduate school "culture." Acton and Walker de Felix (1986) have demonstrated the cyclical nature of language and culture development. As the second language learners are socialized in the new setting, they gain more independence, self-assurance, and language skills, which in turn lead to greater self-actualization in the second culture identity, which fosters even greater language development. Yet the Indonesian students in this study are much like foreign students around the world: they are generally isolated from native-speaking graduate students who could socialize them into the new culture. Perhaps this is another area that needs attention from ESP program developers.

As the world grows in complexity, more scholarly answers will be needed to solve more complex problems. Yet, as Kaplan (1986) has pointed out, most scholarship in the world is written in English. If non-English speaking societies are to have access to that scholarship and if the world's peoples are to have access to the wealth of cognitive experiences of non-English speakers, English language programs for graduate students will need to draw from a wide range of linguistic, cultural, and cognitive realities.

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TABLE 1

Correlation Coefficients

	GR	WR	RD	CLZ	IF	GPA	HRS	ENG	QUIA	$\bar{x}$	SD
LS	0.63025****	0.58015***	0.16140	0.55693***	0.56179***	0.40174	0.18430	0.82108***	0.45985**	12.848484	2.785242
GR		0.43336**	0.05863	0.53822***	0.43549**	0.30587**	0.13096	0.76380****	0.50458**	61.303030	10.672642
WR			-0.00303	0.71065****	0.50811**	0.34546*	0.24957	0.80276****	0.66192****	3.121212	1.268798
RD				0.27298	0.09115	0.30075	-0.07940	0.18165	0.13540	4.030303	0.983769
CLZ					0.55709***	0.51739**	0.31087	0.87792****	0.59565***	5.757575	3.984582
IF						0.42491*	0.22391	0.64934****	0.43662**	4.848484	2.840787
GPA							-0.02953	0.55254***		331.515151	27.301695
HRS								0.26265		26.090909	2.036596
ENG										49.848787	8.937857

Table 2

Effects on Sheltered Master's Coursework

Variable	b	t	Beta	R-square
IF	0.097209	0.355	0.063094	0.4747***
CLZ	0.237081	1.038	0.215837	
LS	0.065774	0.228	0.041857	
WR	1.559870	2.196*	0.452196	

Table 3

Effects on Graduate Grade Point Average

Variable	b	t	beta	R-square
ENG	1.460990	2.403*	0.478290	.3129**
IF	1.098893	0.575	0.114342	